

THE GENUS *TETRACAMPOS* WEDL, 1861

BY
T. SOUTHWELL

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Woodland, in the ' *Annals of Tropical Medicine and Parasitology*,' Vol. XIX, No. 2, p. 185, refers the above genus to the *Bothriocephalidae*.

In a former issue of the ' *Annals*,' I gave certain reasons for referring the genus to the Order *Cyclophyllidea*.

This difference of opinion cannot, unfortunately, be settled by an examination of the worm in question, viz., *T. ciliotheca* Wedl, 1861, because the material is not available.

As the species is stated by Wedl to possess four lappets or bothridia which are figured, it should, on that account, be referred to that Order of Cestodes which is characterised by the possession of four bothridia, viz., the *Tetraphyllidea*. Owing to the fact that Wedl's figure of the head leaves one in considerable doubt as to whether the so-called bothridia are really bothridia, or whether, on the other hand, they are badly figured acetabula; and also having in mind the fact that other cestode parasites with armed heads bearing true acetabula, and with ventral pores, have been repeatedly obtained from fish closely related to that in which *T. ciliotheca* was found, the writer concluded that Wedl's genus *Tetracampos* belonged to the *Proteocephalidae*; and, as in this family the head is armed with four suckers, it was referred to the Order *Cyclophyllidea*.

Up to the present helminthologists have agreed, and rightly, that the primary divisions of the polyzoitic cestodes should be made on the character of the head. Thus, in the *Cyclophyllidea* the head bears four suckers, in the *Tetraphyllidea* four bothridia or lappets, in the *Trypanorhyncha* four proboscides, and in the *Pseudophyllidea* sometimes one or more, but usually two, bothria (or grooves).

The head thus provides a ready and eminently satisfactory means of effecting a natural classification of this group of worms into

Orders, and the utility and simplicity of this means of classification justifies us in retaining it, until a better system is provided.

In the absence of a head, it is frequently impossible to refer a cestode worm to the Order to which it belongs. If the genital pores (excluding the uterine pore or pores, whether primary or secondary) are situated on the ventral surface, the worm is placed in the Order *Pseudophyllidea*; there are, however, exceptions to this rule.

If the genital pores are lateral, then it is necessary to locate the position of the vitelline glands. If this organ consists of numerous follicles situated laterally, it is still impossible to say whether the worm belongs to the Order *Tetraphyllidea* or to the Order *Trypanorhyncha*.

If the gland is single, the worm is referred to the Order *Cyclophyllidea*. Unfortunately, however, there are a number of species which, although they possess a head typical of the *Cyclophyllidea*, have the vitelline glands arranged along the lateral margins, and there are also a few species which, while characterised by having a Tetraphyllidean head, have the vitelline glands condensed into a single mass situated behind the ovary.

The male and female genital organs are of the same type, especially in species of all the three Orders, *Cyclophyllidea*, *Tetraphyllidea* and *Trypanorhyncha*, the trivial differences which exist being limited to the disposition of the musculature, the number of testes, the size of the cirrus pouch, the position of the pore on the lateral margin, etc.—points obviously only of importance in the differentiation of species, or at most of genera. The form of the uterus in the *Pseudophyllidea* is, however, usually characteristic in that Order.

In spite of the fact that in *T. ciliotheca* the head bears four bothridia, or four suckers, Woodland refers the genus to the Order *Pseudophyllidea*, and states that 'scolex characters count for very little.'

Woodland realises that the head of a Bothriocephalid usually possesses two bothria, for he states that the four bothridia in *T. ciliotheca* 'are evidently the four walls bordering the bothriae or sucking grooves.' For a similar reason one could consider the Order *Tetraphyllidea* identical with the *Pseudophyllidea*.

It is true that Wedl states that in *T. ciliotheca* the embryophore is ciliated exactly as it is in *D. latus*. Practically nothing is known

regarding the eggs of the *Tetraphyllidea*, and for this reason one cannot say whether the fact that the embryophore in *T. ciliotheca* is ciliated, has any particular significance or not.

Woodland states that other typically Bothriocephalid features of *T. ciliotheca* are: (1) the shape of the anterior proglottides; it is not stated what this character is, and the writer's experience is that the anterior segments are almost always featureless; and (2) the ventral position of the genital apertures. It has already been pointed out that the uterus in many species of *Proteocephalidae* bursts to the exterior by a slit or a number of slits on the ventral surface, and it is not impossible that what Wedl called a genital pore was a uterine opening.

Referring to the *Proteocephalidae*, Woodland further writes 'for me the possession of lateral vitelline strands and of ventral uterine pores affords two very good reasons for relegating the family to the *Tetraphyllidea*.' It is common knowledge amongst all who have worked with worms of this order, that although in gravid segments the uterus sometimes bursts to the exterior by a slit or slits situated on the ventral surface, the presence of true uterine pores has only been established in about six species. Further, the vitelline glands are not in every case situated laterally.

Woodland's paper is useful in that his figures help one to realise pointedly the wide difference between the head of *T. ciliotheca* and those of the two other species which he considers so closely allied to it.